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EXAMINER

CARTER, AARON W

ART UNIT PAPER NUMBER

2625

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/715,775

**Applicant(s)**

DUIKER, HAARM-PIETER

**Examiner**

Aaron W Carter

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-9 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "the second reading step" in line 1, "the image calibration dataset" in line 2 and "the defined reference object" in line 3. There is insufficient antecedent basis for this limitation in the claim. Examiner will treat the claim as though it is dependent upon claim 6.

Claims 8 and 9 recite the limitation "the defined reference object" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. Examiner will treat the claims as though they are dependent upon claim 6.

Claim 15 recites the limitation "the object-specific panorama" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. Examiner will treat the claim as though it is dependent upon claim 14.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5, 10-19 and 23-28 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN 6,628,298 to Debevec.

As to claim 1, Debevec discloses a method for defining lighting for rendering a digital object, the method comprising:

Reading image datasets each corresponding to a unique coordinate within a limited physical space, each image dataset comprising a plurality of correlated images captured at different exposures (column 5, line 64 – column 6, line 4);

Defining a plurality of panoramic maps, each panoramic map comprising a map of color and intensity information derived from images in a corresponding one of the image sets (column 6, lines 5-14, wherein radiance map corresponds to panoramic map with color and intensity info); and

Modeling a dynamic lighting model from the plurality of panoramic maps, the dynamic lighting model defining lighting for digital rendering as a function of virtual coordinates of a modeled space, and the virtual coordinates are selected from the group consisting of space coordinates, time coordinates, and any combination of space and time coordinates (column 6, lines 15-25, wherein the synthetic objects being rendered into a specific coordinates of an image

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are done so there the use of the radiance map for simulating lighting at those coordinates at those specific moments in time).

As to claim 2, Debevec discloses the method of claim 1, wherein the reading step further comprises reading the unique coordinate defining a location within the defined physical space (column 5, line 64 – column 6, line 4), and wherein the modeling step further comprises defining the dynamic lighting model as a function of the virtual coordinates that define different locations within the modeled space (column 6, lines 21-25, wherein local and distant scene modeling corresponds to different locations within the modeled space).

As to claim 3, Debevec discloses the method of claim 1, wherein the reading step further comprises reading the unique coordinate defining a time at a selected location (column 5, line 64 – column 6, line 4, it is inherent the unique coordinates define a period of time at a selected location), and wherein the modeling step further comprises defining the dynamic lighting model as a function of the virtual coordinates that define different times (column 6, lines 15-25, wherein the synthetic objects being rendered into a specific coordinates of an image are done so there the use of the radiance map for simulating lighting at those coordinates at those specific moments in time).

As to claim 4, Debevec discloses the method of claim 1, wherein the modeling step further comprises modeling the dynamic lighting model as a time-independent function (column

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2, lines 18-29, wherein it is inherent that rendering an object into a still photograph would be time-independent).

As to claim 5, Debevec discloses the method of claim 1, wherein the modeling step further comprises modeling the dynamic lighting model as a time-dependent function (column 2, lines 18-29, wherein it is inherent that rendering an object into several images, such as an actor into a scene of a movie, would be time-dependent).

As to claim 10, Debevec discloses the method of claim 1, wherein the reading step further comprises reading the image data sets comprising images of a convex specularly-reflecting surface (column 5, lines 56-64).

As to claim 11, Debevec discloses the method of claim 1, wherein the modeling step further comprises modeling the dynamic lighting model comprising at least one modeled key light, and at least one modeled fill light (column 6, lines 21-25, wherein the modeled local scene corresponds to key light and distance scene corresponds to fill light).

As to claim 12, Debevec discloses the method of claim 1, wherein the modeling step further comprises modeling the dynamic lighting model comprising a modeled light-emitting surface surrounding a digital object to be rendered (column 6, lines 49-53).

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As to claim 13, Debevec discloses the method of claim 12, wherein the modeling step further comprises subdividing the modeled light-emitting surface in surface regions based on a geometric relationship between a digital object to be rendered and the modeled light-emitting surface (column 7, lines 23-46).

As to claim 14, Debevec discloses the method of claim 14, wherein the modeling step further comprises interpolating an object-specific panorama from the plurality of panoramic maps (column 7, lines 57-65).

As to claim 15, please refer to the rejection made for claims 14 and 11 above.

As to claim 16, please refer to the rejections made for claims 1 and 11 above.

As to claim 17, please refer to the rejections made for claim 1 above.

As to claim 18, please refer to the rejections made for claim 4 above.

As to claim 19, please refer to the rejections made for claim 5 above.

As to claim 23, please refer to the rejections made for claim 10 above.

As to claim 24, please refer to the rejections made for claim 11 above.

As to claim 25, please refer to the rejections made for claim 12 above.

As to claim 26, please refer to the rejections made for claim 13 above.

As to claim 27, please refer to the rejections made for claim 14 above.

As to claim 28, please refer to the rejections made for claim 15 above.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-9 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debevec in view of US Patent Publication 2002/0122589 to Reiman et al. ("Reiman").

As to claim 6, Debevec discloses the method of claim 1.

Debevec does not disclose expressly reading an image calibration dataset comprising images of a defined reference object linked to an identifier of a camera by which each image was captured.

However, Reiman discloses reading an image calibration dataset comprising images of a defined reference object linked to an identifier of a camera by which each image was captured (page 1, paragraphs 0010-0013, wherein chart corresponds to defined reference object).

Debevec & Reiman are combinable because they are from the same field of image analysis and processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the process of image calibration disclosed by Reiman to the light modeling process of Debevec.



The suggestion/motivation for doing so would have been to improve the images derived from capture devices, wherein such images have accurate or preferred rendering of colors (Reiman, page 1, paragraph 0008).

Therefore, it would have been obvious to combine Debevec with Reiman to obtain the invention as specified in claim 6.

As to claim 7, the combination of Debevec and Reiman disclose the method of claim 6, Reiman further discloses wherein the second reading step further comprises reading the image calibration dataset comprising images of the defined reference object selected from a 20-step gray scale and a Macbeth color chart (page 2, paragraph 0028).

As to claim 8, the combination of Debevec and Reiman disclose the method of claim 6, Reiman further discloses color-correcting a plurality of images of the limited physical space based on an analysis of images of the defined reference object (page 1, paragraphs 0012 and 0013).

As to claim 9, the combination of Debevec and Reiman discloses the method of claim 6, Reiman further discloses wherein the defining step further comprises defining the plurality of panoramic maps using the images of the defined reference object to determine characteristics of at least one camera (page 1, paragraphs 0012 and 0013).

As to claim 20, please refer to the rejections made for claim 6 above.

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As to claim 21, please refer to the rejections made for claim 8 above.

As to claim 22, please refer to the rejections made for claim 9 above.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPN 6,160,907 to Robotham et al. discloses a method of modeling light in a scene.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron W Carter whose telephone number is (703) 306-4060. The examiner can normally be reached on 7am - 3:30 am (Mon. - Fri.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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